

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Allocation and Service Rules for the)	WTB Docket No. 19-116
1675–1680 MHz Band)	
To: The Commission		

COMMENTS OF LOCKHEED MARTIN CORPORATION

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June 21, 2019

COMMENTS OF LOCKHEED MARTIN CORPORATION

Lockheed Martin Corporation (“Lockheed Martin”) provides these Comments in response to the Commission’s above-captioned notice of proposed rulemaking regarding the allocation and service rules for the 1675-1680 MHz frequency band.¹ This band is part of the band 1675-1695 MHz allocated on a co-primary basis to the Meteorological Satellite (space-to-Earth) service for both federal and non-federal use in the United States Table of Frequency Allocations. Lockheed Martin has been a long-term provider of systems for environmental intelligence used by National Oceanic and Atmospheric Administration (NOAA) and other federal agencies. For the reasons explained below, Lockheed Martin does not support allocation of the 1675-1680 MHz band to fixed and mobile services; in fact, Lockheed Martin views this proceeding as premature until the NOAA studies are complete, given the public safety implications of any decision here.

I. INTRODUCTION AND SUMMARY

Lockheed Martin’s space engagement encompasses global communications and global positioning to deep space exploration, weather and remote sensing, military space, national security, and advanced technology development. Lockheed Martin manufactures satellite buses that form the core for nearly any space mission from nanosats to high-powered spacecraft. Lockheed Martin is a developer and manufacturer of advanced satellite systems and solutions operating in the United States and around the world, providing a variety of services that are deployed, or soon to be deployed, in all of the satellite frequency bands in use today. Lockheed

¹ *Allocation and Service Rules for the 1675–1680 MHz Band*, Notice of Proposed Rulemaking in WTB Docket No. 19-116, FCC 19-43 (rel. May. 13, 2019) (“*NPRM*”).

Martin is building NOAA's fourth generation GOES satellites, the GOES-R/S/T/U Series, and has delivered the first two spacecraft. GOES-R and -S, now operational on orbit as GOES-16 and -17, provide direct downlink of their complete set of instrument data via the L-band GOES Re-Broadcast Service (GRB). Accordingly, Lockheed Martin has a first-hand understanding of the complexity of the services in this band.

Lockheed Martin asserts that the public interest would be compromised by the Commission proceeding with allocating this spectrum to fixed and mobile services without having a full understanding of both the impacts to non-federal users of the band that receive transmissions from the GOES satellites and the higher power levels (both in band and out of band) by the proposed services on all receivers and the impacts to public safety as a result. The Commission should only proceed when it has such an analysis of the impacts from NOAA as opposed to any substitution of the expert operating agency.

II. DISCUSSION

First, the services most susceptible to interference are the GOES-Variable (GVAR) broadcast from NOAA's spare legacy geostationary satellites, GOES-13, -14, and -15 spacecraft, and GOES Rebroadcast (GRB) from the GOES-16 and -17 spacecraft. The investment to date in satellite hardware and software to support GRB is over \$10 million per spacecraft. NOAA's ground system investment to support receipt of data via this service and generation of information products from it are significantly larger. GVAR and GRB provide direct and near-instantaneous access to all the geostationary weather observations to numerous other government, private sector, and academic users. GVAR operates within the overlapping 1675-1680 MHz band. GRB operates within the adjacent band. Interference into GVAR and GRB receivers would result in a corruption or loss of critical real-time weather images, total lightning

mapping, and solar ultraviolet images the effect of which would be significantly degraded forecasts of severe weather, a public safety concern.

The GRB stream, like the GVAR downlink, provides real-time weather image data at the lowest latency possible for operational use by meteorologists. In a forecast setting, the immediate availability of such images is critical to making short-fused decisions about weather warnings. Interference on this downlink will result in missing or corrupted images of important weather phenomena (e.g., dust storms, volcanic ash, cloud icing), leaving forecasters with no means to accurately forecast and issue warnings for such risks.

Lockheed Martin has significant expertise in both GVAR and GRB direct-readout systems, having developed, deployed, maintained, and modernized such systems for the U.S. Air Force (USAF) for over 15 years. The USAF system, known as Mark IV-B, includes image processing and analysis software and restricted image product sharing capabilities across USAF sites. Multiple USAF Mark IV-B sites receive data for critical aviation weather analysis and tactical forecasting use to ensure a full understanding of the environment facing military operations.

Beyond Lockheed Martin's Mark IV-B system for the USAF, several other commercial companies have spent internal research and development funds to develop marketable GRB product systems. Some of these systems have been purchased and put into place by both commercial and government users, from private forecasting companies to the U.S. Navy. The commercial market for these receive systems is expected to grow as the advanced capabilities of the fourth generation GOES satellites are increasingly exploited for weather and environmental surveillance.

Second, the Commission proposes a completely alternative approach to today's direct

readout of GVAR and GRB. Specifically, it proposes to substitute a terrestrial-based architecture, either through the use of the Internet or other options. While it is unknown as to how many non-federal earth stations receive NOAA's weather products, Lockheed Martin supports having NOAA complete the study of the feasibility of alternative architectures for real-time distribution of its weather products in advance of this proceeding moving forward – if for no other reason than to ensure no loss of the critical capabilities to the end users, given the importance of timeliness of weather data for public safety.

Finally, the Commission proposes to allow fixed and base stations to operate up to 2000 watts peak equivalent isotropically radiated power (EIRP). This is significantly higher than transmissions received from space. An analysis on the impact to both in band and out of band receivers must be undertaken, with NOAA being the best suited organization to conduct such an analysis, in particular given the strong public interest in ensuring that there is no deterioration in the quality and timing of weather information. The Commission's public safety mission must be prioritized over its seemingly overarching goal of repurposing federal spectrum for commercial wireless use.

III. CONCLUSION

Lockheed Martin views that any risk to timely, accurate weather-dependent operational decisions resulting from lost data would pose unacceptable risks to the public safety, whether decisions taken by the federal government or the private-sector weather enterprise. For the reasons discussed above, Lockheed Martin does not support allocation of the 1675-1680 MHz band to fixed and mobile services within the current federal primary use allocation that supports our critical weather infrastructure. Lockheed Martin urges the Commission to pause this

proceeding, and when it receives NOAA's study conclusions, restart the proceeding by placing such results out for public notice and comment.

Respectfully submitted,

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